14. Bear Lake Section

v. 2015-12-28

Section Description

The Bear Lake Ecological Section is part of the Wyoming Basins Ecoregion. That portion of the Bear Lake Section located in Idaho is the subject of this review. It is located in southeast Idaho, bordering Wyoming to the east and Utah to the south. This section encompasses portions of the Bear River, Bear Lake, the Bear Lake Valley, as well as dry hillsides and ridges to the east of the Lake, referred to as the Bear Lake Plateau. Bear Lake drains through Bear River, which is a tributary of Great Salt Lake (Fig. 14.1).

The Bear Lake Ecological Section provides a diversity of landscape features and wildlife habitat including sagebrush steppe, riparian, and Bear Lake pictured above.

The Bear Lake Ecological Section ranges in elevations from 1800–2400 m (5900–7800 ft.). Precipitation ranges from 40 to 100 cm (16 to 40 in) annually with most occurring during the fall, winter and spring. Precipitation occurs mostly as snow above 1800 m (6000 ft.). Summers are dry with low humidity. Temperature averages 1–9°C (34–48°F). The growing season ranges from 50–180 days.

Livestock grazing is the primary land use in this ecological section; however, agricultural production also occurs, with hay and grain being the primary crops. Outdoor recreation is mostly associated with Bear Lake and includes angling, boating, and camping. Other outdoor recreation includes big game, upland game, and waterfowl hunting as well as wildlife viewing. There has been increasing residential development, including second homes, used seasonally, around Bear Lake and the associated uplands. In addition to private land ownership, the section includes Bear Lake National Wildlife Refuge (NWR) managed by the US Fish and Wildlife Service (USFWS), public lands administered by the Bureau of Land Management (BLM), and State owned lands administered by the Idaho Department of Lands (IDL). Land ownership for the section is displayed on Fig. 14.1.

The Bear Lake Ecological Section contains diverse vegetation and land cover types (Figure 14.2) that provide habitat for a diversity of wildlife species, some of which are unique to the Section.

Bear Lake contains a unique fish fauna that includes four endemic species. These species include Bear Lake sculpin (*Cottus greenei*), Bear Lake whitefish (*Prosopium abyssicola*), Bonneville cisco (*Prosopium gemmifer*), and Bonneville whitefish (*Prosopium spilonotus*). Bonneville cutthroat trout (*Oncorhynochus clarkia utah*) are present in both Bear Lake and Bear River and are an important conservation species for the Bear Lake Ecological Section. Lake trout (*Salvelinus namaycush*), rainbow trout (*Oncorhynchus mykiss*), brook trout (*Salvelinus fontinalis*), and brown trout (*Salmo trutta*), nonnative species present in the section, provide important recreational value; however they are managed to insure the persistence of viable populations of native fish species. Because Bear Lake spans both Idaho and Utah, fisheries resources in the Lake are managed collaboratively by the two states through the implementation of the Bear Lake Fisheries Management Plan (Tolentino and Teuscher, 2010).

Wetlands and riparian habitat associated with Bear Lake and the Bear River provide important habitat for a variety of wildlife, most notably migratory waterfowl, waterbirds and neotropical landbirds, as well as amphibians and foraging herbivores (invertebrates to large ungulates). The wetlands, most of which are managed by the Bear Lake NWR, provide nesting habitat for important conservation focus species such as Trumpeter Swan (*Cygnus buccinators*), American Bittern (*Botaurus lentiginosus*), White-faced Ibis (*Plegadis chihi*), Franklin's Gull (*Leucophaeus pipixcan*), California Gull (*Larus californicus*), Caspian Tern (*Hydroprogne caspia*), and Clark's Grebe (*Aechmophorus clarkia*). Wetlands, wet meadows, and managed pasture provide foraging habitat for White-faced Ibis and American Bitterns, and nesting, foraging and staging habitat for Sandhill Crane (*Grus canadensis*).

The upland habitat in Bear Lake Ecological Section consists primarily of sagebrush steppe rangeland managed for livestock grazing. Sagebrush species are predominately Wyoming big sage (*Artemisia tridentate*) and black sage (Artemisia nova). Native grasses, such as bluebunch wheatgrass (*Agropyron specatum*) and needle and thread grass (*Stipa comata*), persist in the sage steppe habitat, however cheatgrass (*Bromus tectorum*) is a common invasive species. Portions of native shrub steppe habitat that were converted to agricultural production in the past have been enrolled in the Conservation Reserve Program (CRP) and are currently established as managed perennial grasslands, some of which have sagebrush recolonization. Populations of Greater Sage-Grouse (*Centrocercus urophasianus*), Sharp-tailed Grouse (*Tympanucus phasianellus*), and Pygmy Rabbit (*Brachylagus idahoensis*) depend on sagebrush steppe habitat to maintain viable populations in the ecological section. Sharp-tailed Grouse have benefited from the establishment of CRP acres.

The Bear Lake Plateau, situated east of Bear Lake and extending to the Wyoming border on the east and the Utah border on the south, is an important big game winter range. Mule deer (*Odocoileus hemionus*) winter on the Plateau as well as use the riparian and wetlands associated with the Bear River and Bear Lake. In recent years, as many as 3,000 mule deer migrate to the Plateau to winter where snow depths are generally moderate to low on the areas extensive south and west facing slopes. The fall/winter movement through the corridor is generally southward from the Caribou National Forest through the Sheep Creek Hills across Highway 30, the Union Pacific Railroad tracks, and the Bear River. Additionally, because the Bear

Lake Plateau as well as adjacent areas contains predicted wolverine (*Gulo gulo*) habitat (IDFG 2014) the corridor may serve as a dispersal corridor for wolverine. Mule deer road kills are common in the corridor in the fall, winter, and early spring. These road kill carcasses attract scavenging Bald and Golden Eagles which are then subject to vehicle collisions as well.

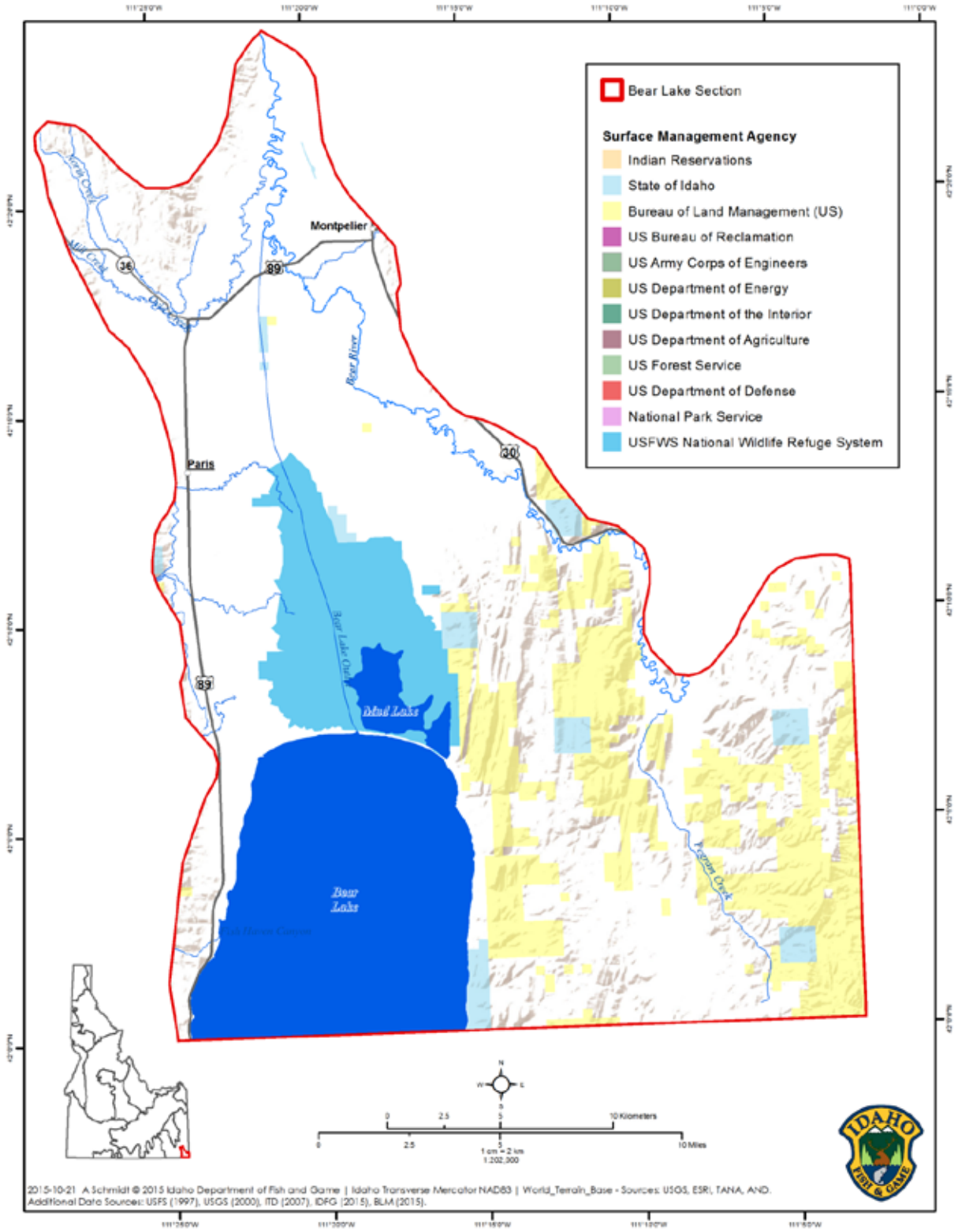

Fig. 14.1 Map of Bear Lake surface management

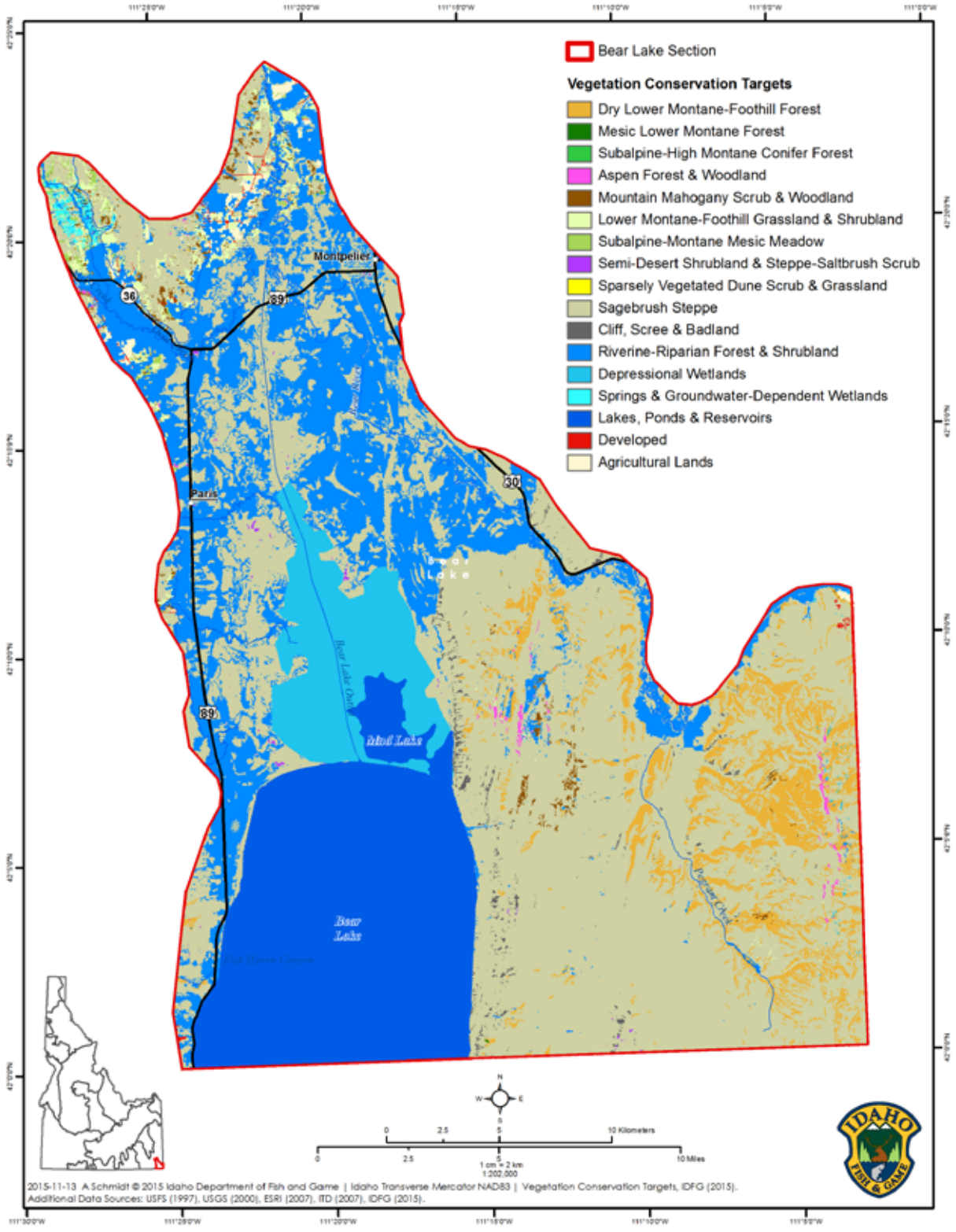

Fig. 14.2 Map of Bear Lake vegetation conservation targets

Conservation Targets in the Bear Lake Ecological Section

We selected 3 habitat based targets (1terrestrial and 2 aquatic) that represent the major ecosystems in the Bear Lake Section as shown in Table 14.1. Each of these systems provides habitat for key Species of Greatest Conservation Need (SGCN), i.e., 'nested targets' (Table 14.2) associated with each target. All SGCN management programs in the Bear Lake Ecological Section have a nexus with habitat management programs. We provide a high-level summary of current viability status for each target. Conservation of the habitat targets listed below should conserve most of the nested species within them. However, we determined that at least 3 taxonomic groups—Bear Lake endemic fish, colony-nesting birds, and pollinators—face special conservation needs and thus are presented as explicit species targets as shown in Table 14.1. Additionally, we identified a target to preserve an important wildlife movement corridor into the Bear Lake Plateau Section.

Table 14.1 At-a-glance table of conservation targets in the Bear Lake Ecological Section

Target	Target description	Target viability	Nested targets (SGCN)	
Sagebrush Steppe	This is the predominate habitat type in the Bear Lake Section, occurring on the Bear Lake Plateau on the east side of Bear Lake to the Wyoming and Utah borders and also present to a lesser extent on the west side of Bear Lake where it is more fragmented by agriculture and development. This target provides important habitat for a diversity of wildlife species, including several SGCN that are also considered sagebrush obligates.	*Fair*. Sagebrush habitat throughout the Section has been reduced by development and conversion to agriculture. Some of agricultural conversion has been enrolled in CRP and there is some sagebrush recolonization into these fields. Fragmentation, invasive species, fire, and sagebrush treatments impact the viability of this target.	*Tier 1* *Tier 2* *Tier 3*	Greater Sage-Grouse Sharp-tailed Grouse Long-billed Curlew Ferruginous Hawk Golden Eagle Sage Thrasher Common Nighthawk Pygmy Rabbit Wyoming Ground Squirrel Lyrate Mountainsnail A Tiger Beetle (*Cicindela decomnotata montevolans*) Short-eared Owl Townsend's Big-eared Bat Western Small-footed Myotis
Riverine–Riparian Forest and Shrubland	This habitat target encompasses rivers and streams, including aquatic habitat and the associated riparian and wetland vegetation types. This target includes tributaries to Bear Lake and Bear River and its tributaries and Bear River flood	*Fair*. Riverine systems are fragmented by diversions that remove water for crop and pasture irrigation. Additionally, water management has altered the hydrograph of riverine systems. Other impacts affecting this target	*Tier 1* *Tier 2* Tier 3	Bear Lake Springsnail Northern Leopard Frog Western Toad White-faced Ibis Long-billed Curlew Hoary Bat Silver-haired Bat Rocky Mountain Duskysnail Sandhill Crane Townsend's big-eared Bat Western Small-footed Myotis Little Brown Myotis

Target	Target description	Target viability	Nested targets (SGCN)	
	plain. This target provided important habitat for a diversity of wildlife species.	include water quality, water quantity, and loss of riparian habitat. The diversion of water from Bear River into Bear Lake for irrigation storage purposes has altered the hydrograph of the Bear River flood plain.		California Floater Pond Snail (Stagnicola) Species Group Rotund Physa Utah Sallfly
Depressional Wetlands	This habitat target is influenced by snowmelt and rain and wetlands ranges from infrequent to semi-permanent or permanently flooded. The target includes primarily shallow water marshes, and deep water marshes in the Bear Lake Section. This target provides important breeding and foraging habitat for many bird species.	*Fair*. The diversion of water from Bear River into the Bear Lake for irrigation storage purposes has altered the hydrology and natural process of large tract of wetland habitat located at the north end of Bear Lake, much of which is encompassed in the Bear Lake National Wildlife Refuge.	*Tier 2* Tier 3	Northern Leopard Frog Western Toad Trumpeter Swan Black Tern Caspian Tern California Gull Clark's Grebe Western Grebe White-faced ibis American Bittern Sandhill Crane Franklin's Gull
Bear Lake Endemic Fish	There are four endemic fish species in the Bear Lake. There is an assumption that if the populations of endemic fish are healthy the entire lake ecosystem will be conserved.	*Good*. The Bear Lake Fisheries Management Plan includes population targets for endemic fish species. IDFG and Utah Division of Wildlife Resources monitor fish populations to insure targets are being met. The Bear Lake Fisheries Management Plan calls for stocking sterile lake trout and rainbow trout and stocking lake trout at a rate that will ensure sustainability of endemic fish populations.	*Tier 2*	Bear Lake Sculpin Bear Lake Whitefish Bonneville Cisco Bonneville Whitefish
Wildlife Movement Corridor	An important wildlife movement corridor exists that links big game summer habitats north of the	*Fair*. Highway 30 and Union Pacific Railroad bisect the wildlife movement corridor. The	*Tier 1* Tier 2	Wolverine Golden Eagle

Target	Target description	Target viability	Nested targets (SGCN)	
	Bear Lake Plateau with winter range on the Plateau. The corridor may also provide a dispersal corridor for wolverine. Mule deer mortality as they move through this corridor, due to vehicle collisions, is linked to golden and bald eagle mortality resulting from vehicle collisions as well.	highway is used extensively by commercial semi-trucks as a 'short-cut' between interstates 15 and 80. An estimated 3,000 mule deer move through this corridor to winter on the Bear Lake Plateau. Mule deer/vehicle collisions are common between Montpelier and the Wyoming Border, particularly during the fall and spring migration and during winter months. Mule deer mortalities provide scavenging opportunities for bald and golden eagles leading to eagle/vehicle collisions and subsequent eagle mortalities.		
Pollinators	The presence and distribution of SGCN pollinators is not well documented or understood in the Bear Lake Ecological Section.	Viability of this target is unknown in the Bear Lake Ecological Section	Tier 1	Morrison Bumble Bee Western Bumble Bee Suckley Cuckoo Bumble Bee
			Tier 3	Hunt Bumble Bee Kriemhild Fritillary Monarch

Table 14.2 Species of Greatest Conservation Need (SGCN) and associated conservation targets in Bear Lake

Taxon	Conservation targets					
	Movement Corridor	Sagebrush Steppe	Depressional Wetlands	Riverine	Bear Lake Fish	Pollinators
FISH						
Bear Lake Sculpin					X	
Bear Lake Whitefish					X	
Bonneville Cisco					X	
Bonneville Whitefish					X	
AMPHIBIANS						
Northern Leopard Frog			X	X		
Western Toad			X	X		
BIRDS						
Trumpeter Swan			X	X		
Greater Sage-Grouse		X				
Sharp-tailed Grouse		X				
Clark's Grebe			X			
Western Grebe			X			
American Bittern			X			
White-faced Ibis			X	X		
Golden Eagle	X	X				
Sandhill Crane			X	X		
Long-billed Curlew		X		X		
Franklin's Gull			X			
California Gull			X			
Caspian Tern			X			
Black Tern			X			
Sage Thrasher		X				
Ferruginous Hawk		X				
Common Nighthawk		X				
Short-eared Owl		X				
MAMMALS						
Hoary Bat				X		
Silver-haired Bat				X		
Townsend's Big-eared Bat		X		X		
Western Small-footed Myotis		X		X		
Little Brown Myotis		X		X		
Pygmy Rabbit		X				
Wolverine	X					
BIVALVES						
California floater				X		

Taxon	Conservation targets					
	Movement Corridor	Sagebrush Steppe	Depressional Wetlands	Riverine	Bear Lake Fish	Pollinators
AQUATIC SNAILS						
Pond Snail (*Stagnicola*) Species Group				X		
Rotund Physa				X		
Rocky Mountain Duskysnail				X		
Bear Lake Springsnail				X		
LAND SNAILS						
Lyrate Mountainsnail		X				
INSECTS						
A Tiger Beetle (*Cicindela decomnotata montevolans*)		X				
Hunt Bumble Bee						X
Morrison Bumble Bee						X
Western Bumble Bee						X
Suckley Cuckoo Bumble Bee						X
Kriemhild Fritillary						X
Monarch						X
Utah Sallfly				X		

Target: Sagebrush Steppe

Sagebrush steppe is the most abundant habitat type in the Bear Lake Ecological Section, making up nearly 50 percent of the vegetation cover type in the section. The Bear Lake Plateau on the east side of Bear Lake to the Wyoming and Utah borders is predominantly sagebrush steppe, however, the habitat has been fragmented by past agricultural conversion, some of which has been enrolled in CRP. Portions of the ecological section on the west side of Bear Lake also contain sagebrush steppe habitat, although it has been fragmented by both agriculture and development.

Sagebrush species found in the Bear Lake Ecological Section are predominately Wyoming big sage and black sage. Native grasses, such as bluebunch wheatgrass and needle-and-thread grass persist in the sage steppe habitat and cheatgrass is a common invasive species. Agricultural areas that are enrolled in CRP are dominated by nonnative grass species, but, sagebrush has begun to encroach into some fields.

A diversity of wildlife species rely on the sagebrush steppe habitats found in the Bear Lake Ecological Section, including several SGCN. Of particular management concern are populations of Greater Sage-Grouse. The Bear Lake Plateau is identified as Priority Habitat

Management Area for Sage-Grouse conservation (Fig. 14.3). Sagebrush steppe conservation and management actions that benefit Sage-Grouse are expected to benefit other sagebrush dependent SGCN.

Sagebrush steppe habitat is the most abundant habitat type in the Bear Lake Ecological Section, with most of this habitat type being located on the Bear Lake Plateau east of Bear Lake. The image above illustrates the typical topography and native sagebrush habitat found on the Bear Lake Plateau. The Bear Lake Plateau provides important habitat for Sage-Grouse, pygmy rabbit and other sagebrush dependent species.

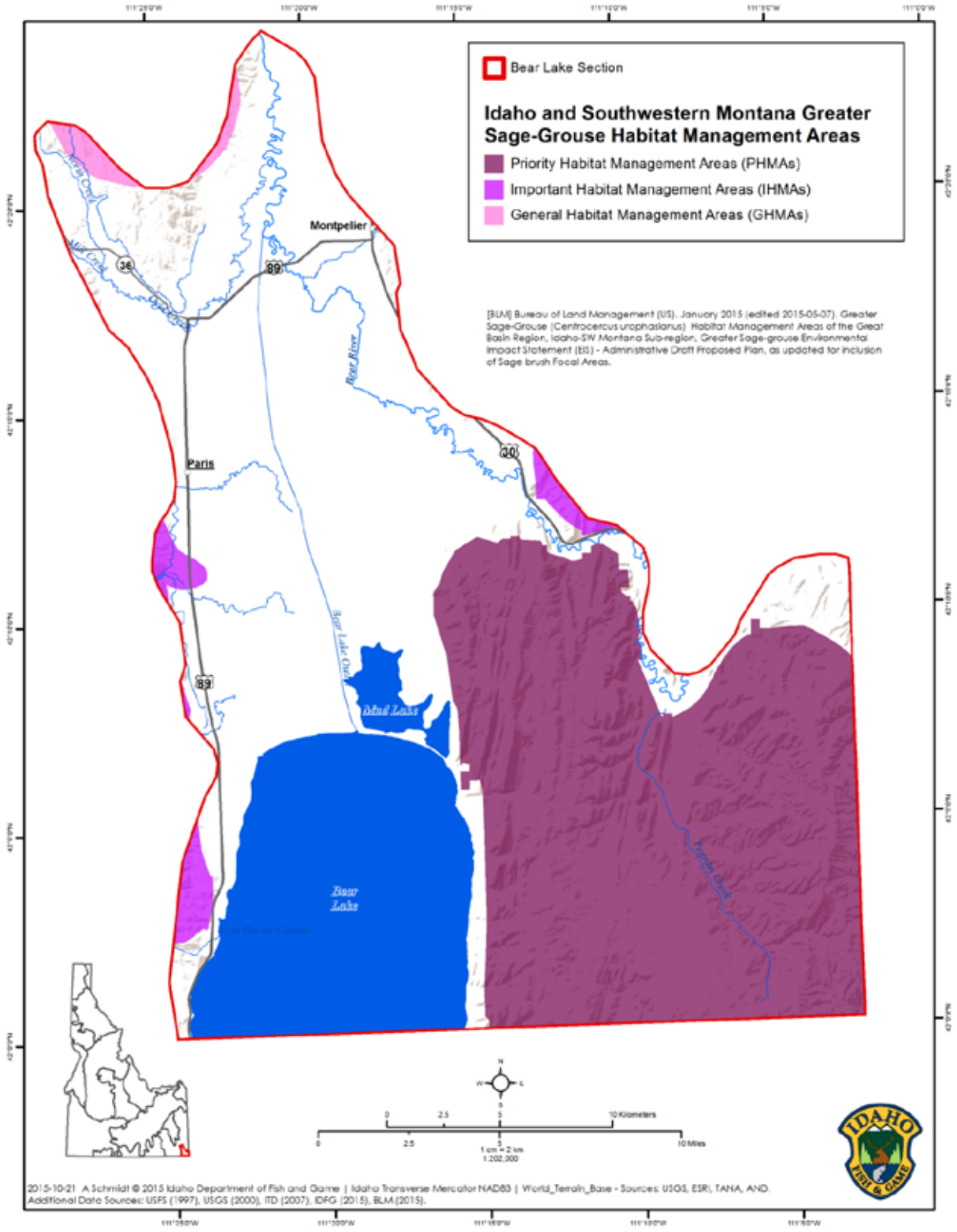

Fig. 14.3 Idaho and Southwestern Montana Greater Sage-Grouse Habitat Management Areas

Target Viability

Sagebrush steppe habitat in the Bear Lake Ecological Section is generally in fair condition, and is functioning to provide important habitat for sagebrush obligates and other wildlife species. Sagebrush steppe habitat has been reduced by development and conversion to agriculture. Some of lands subject to agricultural conversion have been enrolled in CRP and there is some sagebrush recolonization into these fields. Conversion, fragmentation, invasive species, fire, and sagebrush treatments have resulted in not only loss of habitat, but also a decline in the condition of the remaining habitat in many areas. The patchwork of ownership that includes IDL and private property may increase the risk for further habitat loss or degradation from sagebrush treatment projects. BLM lands are fragments with some small acreage isolated tracts that may be subject to disposal in the future, creating an additional risk of potential degradation and loss of sagebrush habitat. The continuation of wildlife habitat enhancement and protection using CRP and other Farm Bill Programs is reliant on federal funding, as such adding an element of uncertainty to the wildlife habitat currently provided on some privately owned lands. Infrastructure, such as roads, powerlines, and fences affect this habitat type and the wildlife species present. Invasive plants threaten the capability of this target to provide quality wildlife habitat.

Prioritized Threats and Strategies for Sagebrush Steppe

High rated threats to Sagebrush Steppe in the Bear Lake Ecological Section

Nonnative invasive plants

Invasive plant species is a high priority threat to sagebrush habitat in the Bear Lake Ecological Section. They have been identified as a primary to Sage-Grouse in Idaho in the Governor's Alternative (Otter 2012). They are also cited as a primary threat to shrub-steppe habitats by the US Fish and Wildlife Service (Fed Regist. 79[234]:72464–72465). The invasion of nonnative annual grasses—in particular cheatgrass and medusahead—is one of the primary drivers of larger, more intense rangeland fires across the Great Basin and directly threatens the habitat of Greater Sage-Grouse and other sagebrush-steppe dependent wildlife (DOI 2015). In the Bear Lake Section, cheatgrass has colonized the sagebrush steppe habitat, and may influence fire severity and frequency in the future.

Objective	Strategy	Action(s)	Target SGCNs
Reduce invasive plants	Implement actions reduce the spread of invasive plants.	Promote certified weed-free seeds and forage. Enforce travel plans.	Greater Sage-Grouse Sharp-tailed Grouse Long-billed Curlew Ferruginous Hawk Golden Eagle Sage Thrasher Common Nighthawk Pygmy Rabbit Wyoming Ground Squirrel Short-eared Owl Townsend's Big-eared Bat Western Small-footed Myotis

Objective	Strategy	Action(s)	Target SGCNs
			Lyrate Mountainsnail A Tiger Beetle (*Cicindela decomnotata montevolans*)
	Support the use of experimental approaches to control invasive plants	Explore the use of newly developed products or actions to reduce cheatgrass.	Greater Sage-Grouse Sharp-tailed Grouse Long-billed Curlew Ferruginous Hawk Golden Eagle Sage Thrasher Common Nighthawk Pygmy Rabbit Wyoming Ground Squirrel Short-eared Owl Townsend's Big-eared Bat Western Small-footed Myotis Lyrate Mountainsnail A Tiger Beetle (*Cicindela decomnotata montevolans*)
Protect key habitat from loss and degradation	Implement appropriate management of brush treatments	Consider wildlife benefits and reduce impacts to wildlife on all public land (BLM, IDL) brush treatments. Conduct treatments using techniques that will reduce the risk of increases of invasive species. Provide, where possible, input on private land brush treatments.	Greater Sage-Grouse Sharp-tailed Grouse Long-billed Curlew Ferruginous Hawk Golden Eagle Sage Thrasher Common Nighthawk Pygmy Rabbit Wyoming Ground Squirrel Short-eared Owl Townsend's Big-eared Bat Western Small-footed Myotis Lyrate Mountainsnail A Tiger Beetle (*Cicindela decomnotata montevolans*)
Improve/increase native vegetation	Use native seed and seedlings in habitat restoration projects.	Agency coordination on funding sources to support restoration projects. Collect local seed as sources for native plants to be used in restoration projects. Limit the use of nonnative plant species in restoration projects.	Greater Sage-Grouse Sharp-tailed Grouse Long-billed Curlew Ferruginous Hawk Golden Eagle Sage Thrasher Common Nighthawk Pygmy Rabbit Wyoming Ground Squirrel Short-eared Owl Townsend's Big-eared

Objective	Strategy	Action(s)	Target SGCNs
			Bat Western Small-footed Myotis Lyrate Mountainsnail A Tiger Beetle (*Cicindela decomnotata montevolans*)

Improper livestock grazing management

In the context of this plan, "improper" is defined as grazing beyond the capacity of the resource in either direction (e.g., overuse such as along riparian areas that need protection; i.e., there needs to be seasonal adjustments). Negative impacts of grazing are typically associated with persistent heavy grazing. In the Governor's Alternative (Otter 2012), improper livestock grazing management is considered a secondary threat with monitoring and management actions tailored accordingly.

Livestock grazing can affect wildlife habitat in many ways (Krausman et al. 2009). For example, livestock grazing can change habitat features that directly influence birds by reducing plant species diversity and biomass (Reynolds and Trost 1981, Bock and Webb 1984, Saab et al. 1995). Alternatively, changes in water and nutrient cycling caused by grazing can promote the spread of invasive species, which then degrade native bird habitats by altering fire and disturbance regimes (Rotenberry 1998). Sagebrush systems are particularly sensitive to grazing disturbance (Mack and Thompson 1982).

In the Bear Lake Ecological Section, one of the primary risk factors to maintaining viable sagebrush steppe habitat is the fact that large tracts of sagebrush steppe habitat are in private ownership, and thus may lack grazing plans and condition monitoring that help insure best management practices are being used.

Objective	Strategy	Action(s)	Target SGCNs
Promote proper livestock grazing	Develop, follow, and enforce grazing management plans.	Promote private landowners working with NRCS to develop grazing management plans for their private property. Monitor vegetation condition and adjust AUMs and grazing season as needed to meet standards.	Greater Sage-Grouse Sharp-tailed Grouse Long-billed Curlew Ferruginous Hawk Golden Eagle Sage Thrasher Common Nighthawk Pygmy Rabbit Wyoming Ground Squirrel Short-eared Owl Townsend's Big-eared Bat Western Small-footed Myotis Lyrate Mountainsnail A Tiger Beetle (*Cicindela decomnotata montevolans*)
	Educate and incentivize landowners.	Promote best management practices for livestock grazing in sagebrush steppe habitat.	Greater Sage-Grouse Sharp-tailed Grouse Long-billed Curlew

Objective	Strategy	Action(s)	Target SGCNs
		Explore opportunities to provide incentives to public land grazers and private landowners to use best management practices.	Ferruginous Hawk Golden Eagle Sage Thrasher Common Nighthawk Pygmy Rabbit Wyoming Ground Squirrel Short-eared Owl Townsend's Big-eared Bat Western Small-footed Myotis Lyrate Mountainsnail A Tiger Beetle (*Cicindela decomnotata montevolans*)
Improve/increase native vegetation	Use native seed and seedlings in habitat restoration projects.	Agency coordination on funding sources to support restoration projects. Collect local seed as sources for native plants to be used in restoration projects. Limit the use of nonnative plant species in restoration projects.	Greater Sage-Grouse Sharp-tailed Grouse Long-billed Curlew Ferruginous Hawk Golden Eagle Sage Thrasher Common Nighthawk Pygmy Rabbit Wyoming Ground Squirrel Short-eared Owl Townsend's Big-eared Bat Western Small-footed Myotis Lyrate Mountainsnail A Tiger Beetle (*Cicindela decomnotata montevolans*)

Infrastructure

Infrastructure such as roads, highways, high-voltage transmission lines, and cell phone towers (Governor's Executive Order No. 2015-04; Otter 2015) is identified as a primary threat (Otter 2012) and causes fragmentation and direct loss of shrub-steppe habitats (US Fish and Wildlife Service 2014). Power lines will present a collision risk to bird species and provide hunting perches for raptors and ravens may have predation implications for species such as Sage-Grouse and Pygmy Rabbit.

A specific proposed project that presents threats to wildlife and wildlife habitat in the Bear Lake Section is the Gateway West Transmission Line Project (http://www.gatewaywestproject.com/). The projects approved route will run the transmission lines through sagebrush steppe habitat on the Bear Lake Plateau.

Objective	Strategy	Action(s)	Target SGCNs
Reduce impacts of roads and energy transmission projects on wildlife and wildlife habitat	Implement and enforce travel management plans.	Provide information on travel management through public outreach efforts, provide maps, both hard copies and options to obtain electronically, and maintain on the ground signage.	Greater Sage-Grouse Sharp-tailed Grouse Long-billed Curlew Ferruginous Hawk Golden Eagle Sage Thrasher Common Nighthawk

Objective	Strategy	Action(s)	Target SGCNs
			Pygmy Rabbit Wyoming Ground Squirrel Short-eared Owl Townsend's Big-eared Bat Western Small-footed Myotis Lyrate Mountainsnail A Tiger Beetle (*Cicindela decomnotata montevolans*
	Coordinate development/location and management of roads, powerlines, pipelines, etc. to avoid important habitat areas and minimize the impact to wildlife.	Place roads and energy related infrastructure away from leks, riparian areas and other sensitive wildlife habitat. Place new roads, power lines, and infrastructure projects along existing corridors or within other altered habitats to the extent possible. Place seasonal closures on roads to protect wildlife during critical time periods, such as wintering, breeding, fawning/calving.	Greater Sage-Grouse Sharp-tailed Grouse Long-billed Curlew Ferruginous Hawk Golden Eagle Sage Thrasher Common Nighthawk Pygmy Rabbit Wyoming Ground Squirrel Townsend's Big-eared Bat Western Small-footed Myotis Lyrate Mountainsnail A Tiger Beetle (*Cicindela decomnotata montevolans*
Reduce bird power line strikes and electrocutions	Work with power companies to implement practices and install apparatus to reduce collisions and electrocutions.	Keep records of bird power line collisions and electrocutions. Suggest monitor new power lines to document collision and electrocution concerns. Identity and map areas with power line collisions and electrocutions. Promote bury power lines in areas that experience high numbers of bird strikes. Promote attaching bird diverters to make power lines more visible. Promote modifying power line structures to eliminate bird perch/roost sites.	Greater Sage-Grouse Sharp-tailed Grouse Ferruginous Hawk Golden Eagle Short-eared Owl
Reduce the impact of fences as barriers and collision risk for wildlife.	Maintain marked fences near sage-grouse leks, in order to increase visibility.	Identify fences near leks. Collaborate with partners to insure fences are marked for visibility. Use volunteers where appropriate to help maintain marked fences.	Species?

Inappropriate habitat treatment and restoration activities

Sagebrush treatments designed to reduce brush and increase grass to benefit grazing continues to be implemented in the Bear Lake Ecological Section. These treatments may include burning, herbicide treatment, and mechanical treatment. The fact that large tracts of sagebrush steppe

habitat are privately own increases the threat of future sagebrush treatments that may impact habitat important to local Greater Sage-grouse populations, as well as other sagebrush obligate species. An additional related concern included the practice of using nonnative species for restoration or reseeding projects. While nonnative species may provide a faster, cheaper alternative compared to native species when habitat has been disturbed or degraded, they typically do not provide equivalent benefits to wildlife species conservation.

Objective	Strategy	Action(s)	Target SGCNs
Improve/increase native vegetation	Use native seed and seedlings in habitat restoration projects.	Agency coordination on funding sources to support restoration projects. Collect local seed as sources for native plants to be used in restoration projects. Limit the use of nonnative plant species in restoration projects.	Greater Sage-Grouse Sharp-tailed Grouse Long-billed Curlew Ferruginous Hawk Golden Eagle Sage Thrasher Common Nighthawk Pygmy Rabbit Wyoming Ground Squirrel Short-eared Owl Townsend's Big-eared Bat Western Small-footed Myotis Lyrate Mountainsnail A Tiger Beetle (*Cicindela decomnotata montevolans*
Protect key habitat from loss and degradation	Implement appropriate management of brush treatments	Consider wildlife benefits and reduce impacts to wildlife on all public land (BLM, IDL) brush treatments. Conduct treatments using techniques that will not result in increases of invasive species. Provide, where possible, input on private land brush treatments.	Greater Sage-Grouse Sharp-tailed Grouse Long-billed Curlew Ferruginous Hawk Golden Eagle Sage Thrasher Common Nighthawk Pygmy Rabbit Wyoming Ground Squirrel Short-eared Owl Townsend's Big-eared Bat Western Small-footed Myotis Lyrate Mountainsnail A Tiger Beetle (*Cicindela decomnotata montevolans*

Species designation, planning and monitoring

In addition to the conservation actions to address specific threats, some species require inventory and monitoring to assess their status and distribution in Idaho. Population monitoring and survey to determine distribution are needed for several species in the Bear Lake Ecological Section.

Objective	Strategy	Action(s)	Target SGCNs
Improve our knowledge of wildlife	Conduct surveys to monitor species	In collaboration with land management agency partners and private landowners, conduct long-	Greater Sage-grouse Sharp-tailed Grouse Ferruginous Hawk

Objective	Strategy	Action(s)	Target SGCNs
populations and distribution using the sagebrush steppe habitat target.	populations.	term monitoring surveys at established intervals to document population (as well as distribution) changes. Use volunteers, master naturalists, and citizen scientists to the extent possible.	Golden Eagle Pygmy Rabbit
Objective?	Conduct surveys to document species presence, distribution, and abundance.	In collaboration with land management agency partners and private landowners, conduct surveys to document species presence, distribution, and abundance. Use volunteers, master naturalists, and citizen scientists to the extent possible.	Long-billed Curlew Short-eared Owl Common Nighthawk Sagebrush Sparrow Grasshopper Sparrow Wyoming Ground Squirrel Lyrate Mountainsnail A Tiger Beetle (*Cicindela decomnotata montevolans*)

Target: Riverine–Riparian Forest and Shrublands

In the Bear Lake Ecological Section the Riverine habitat target encompasses rivers and streams, including aquatic habitat and their associated terrestrial riparian and wetland habitats. This target includes Bear River and its tributaries and the tributaries to Bear Lake. Riparian habitat is the second most abundant habitat type in the Bear Lake Ecological Section and accounts for approximately 20% of the vegetation land cover type. Riparian habitat is diverse and includes a variety of grasses, forbs, and woody species such as willow spp., red osier dogwood (*Cornus sericea*), chokecherry (*Prunus Virginiana*), and narrowleaf (*Populus angustifolia*) cottonwood associated with the Bear River and small streams. Scattered cottonwoods are found associated with the Bear River in the Dingle area and upstream to the Pegram Creek

The Bear River is a dominate feature in the Bear Lake Ecological Section, providing many miles of riparian habitat important to several SGCN and other fish and wildlife. It's headwaters in the Uinta Mountain range in Northern Utah, It flows through Wyoming and Idaho and finally empties into the Great Salt Lake. At 491 miles in length, it is the longest river in North American that does not empty in to the sea.

area. The Riverine habitat target also includes wet meadows and wetlands influenced by the river and stream flooding and overflow as well as overland runoff for adjacent uplands as streams and precipitation. This habitat type provides important habitat for an number of SGCN including, breeding areas northern leopard frog and western toad, winter foraging and resting habitat for Trumpeter Swans, foraging habitat for White-faced Ibis and Sandhill Crane, foraging and roosting habitat for bat species.

Target Viability

Riverine systems in the Bear Lake Ecological Section are affected by water diversions for crop and pasture irrigation. As a result there are negative impacts associated with altered hydrograph, water quality, water quantity, and loss of riparian habitat. The Bear River riparian habitat has been eliminated, reduced, and only in fair condition in many stretches. The diversion of water from Bear River into Bear Lake for irrigation storage purposes has altered the hydrograph of the Bear River flood plain, reducing the viability of the riparian, wet meadow, and riverine wetland habitats. Riverine habitat associated with smaller tributaries is affected by reduced water flows due water diversions. Wetlands associated with riverine habitat are also affected by water removal through the spring and summer that results in lower than normal flows. The lack of floodplain connectivity to the stream channel affects this habitat target. These conditions affect the capability of the this target to support SGCN as diverse as breeding northern leopard frog, wintering Trumpeter Swan, foraging and roosting bat species. Additionally, the wet meadows are often cut for hay and used for livestock grazing, practices that may reduce benefits as nesting and foraging habitat for associated bird species.

Prioritized Threats and Strategies for Riverine - Riparian Forest and Shrublands

High rated threats to Riverine in the Bear Lake Ecological Section

Improper livestock grazing management

Livestock grazing can affect wildlife habitat in many ways (Krausman et al. 2009). For example, livestock grazing can change habitat features that directly influence birds by reducing plant species diversity and biomass (Reynolds and Trost 1981, Bock and Webb 1984, Saab et al. 1995). Alternatively, changes in water and nutrient cycling caused by grazing can promote the spread of invasive species, which then degrade native bird habitats by altering fire and disturbance regimes (Rotenberry 1998).

In the Bear Lake Ecological Section, one of the primary factors that contribute to this problem is the fact that riverine habitat is in private ownership, and may lack grazing plans and condition monitoring.

Objective	Strategy	Action(s)	Target SGCNs
Promote proper livestock grazing	Develop grazing management plans.	Promote private landowners working with NRCS to develop grazing management plans for their private property. Monitor vegetation condition and	Northern Leopard Frog Western Toad Sandhill Crane Long-billed Curlew White-faced Ibis Hoary Bat

Objective	Strategy	Action(s)	Target SGCNs
		adjust AUMs and grazing season as needed to meet standards.	Silver-haired Bat Townsend's big-eared Bat Western Small-footed Myotis Little Brown Myotis California Floater Pond Snail (Stagnicola) Species Group Rotund Physa Rocky Mountain Duskysnail Bear Lake Springsnail Utah Sallfly
	Educate and incentivize landowners.	Promote best management practices for livestock use of riparian habitats. Explore opportunities to provide incentives to public land grazers and private landowners to use best management practices.	Northern Leopard Frog Western Toad Sandhill Crane Hoary Bat Silver-haired Bat Townsend's big-eared Bat Western Small-footed Myotis Little Brown Myotis California Floater Pond Snail (Stagnicola) Species Group Rotund Physa Rocky Mountain Duskysnail Bear Lake Springsnail Utah Sallfly
Protect and improve riparian habitat	Develop off-site watering areas and/or gaps to reduce impacts to springs, wetlands, and riparian areas.	Work with land management agencies to identify for opportunities to develop off-site watering, particularly along the Bear River and in the Pegram Creek drainage of the Bear Lake Plateau. Where possible work with landowners to develop off-side watering on private property, particularly along the Bear River and in the Pegram Creek drainage of the Bear Lake Plateau, and provide assistance when appropriate and possible. Including providing technical support and identifying possible funding sources.	Northern Leopard Frog Western Toad Sandhill Crane Hoary Bat Silver-haired Bat Townsend's big-eared Bat Western Small-footed Myotis Little Brown Myotis California Floater Pond Snail (Stagnicola) Species Group Rotund Physa Rocky Mountain Duskysnail Bear Lake Springsnail Utah Sallfly
	Install livestock exclusion fencing to protect riparian areas.	Work with land management agencies to identify opportunities to fence riparian areas to better manage grazing effects, particularly along the Bear River and in the Pegram Creek drainage of the Bear Lake Plateau. Where possible work with landowners to use riparian fencing to better manage grazing effects on private property, particularly	Northern Leopard Frog Western Toad Sandhill Crane Hoary Bat Silver-haired Bat Townsend's big-eared Bat Western Small-footed Myotis Little Brown Myotis California Floater Pond Snail (Stagnicola) Species Group

Objective	Strategy	Action(s)	Target SGCNs
		along the Bear River and in the Pegram Creek drainage of the Bear Lake Plateau, and provide assistance when appropriate and possible. Including providing technical support and identifying possible funding sources.	Rotund Physa Rocky Mountain Duskysnail Bear Lake Springsnail Utah Sallfly

Water management altering hydrograph

The diversion of water for crop and pasture irrigation affects the riverine hydrograph as well as water quality, water quantity, and has resulted in the loss and degradation of riparian habitat. The altered hydrography of the Bear River flood plain, caused by lower than normal flows in the spring and summer, reduces the viability of the riparian, wet meadow, and riverine wetland habitats. The altered hydrograph has resulted in the loss or decline of connectivity within riverine systems and between riverine and floodplain habitat. The diversion of water from streams in the spring results lower than normal flows, rather than allowing for more natural high water runoff flows that connects and recharges the floodplain.

Objective	Strategy	Action(s)	Target SGCNs
Reduce water use to maintain a more natural hydrograph	Enroll/maintain acreage in CRP/SAFE and other land conservation programs.	Encourage landowners to work with NRCS to use wildlife conservation practices on private range and agricultural lands.	Northern Leopard Frog Western Toad Trumpeter Swan Sandhill Crane Long-billed Curlew White-faced Ibis Hoary Bat Silver-haired Bat Townsend's big-eared Bat Western Small-footed Myotis Little Brown Myotis California Floater Pond Snail (Stagnicola) Species Group Rotund Physa Rocky Mountain Duskysnail Bear Lake Springsnail Utah Sallfly
Objective?	Water use does not exceed water right allocation.	Work with irrigation companies to insure water use is appropriately allotted. Promote the use of improved equipment for accurate cfs measurement.	Northern Leopard Frog Western Toad Trumpeter Swan Sandhill Crane Long-billed Curlew White-faced Ibis Hoary Bat Silver-haired Bat Townsend's big-eared Bat Western Small-footed Myotis Little Brown Myotis California Floater Pond Snail (Stagnicola) Species Group Rotund Physa Rocky Mountain Duskysnail

Objective	Strategy	Action(s)	Target SGCNs
			Bear Lake Springsnail Utah Sallfly
Objective?	Improve irrigation practices and equipment for more efficient use.	Where appropriate encourage the conversion from flood irrigation to sprinkler irrigation.	Northern Leopard Frog Western Toad Sandhill Crane Long-billed Curlew White-faced Ibis Hoary Bat Silver-haired Bat Townsend's big-eared Bat Western Small-footed Myotis Little Brown Myotis California Floater Pond Snail (Stagnicola) Species Group Rotund Physa Rocky Mountain Duskysnail Bear Lake Springsnail Utah Sallfly
Maintain/improve habitat connectivity within riverine systems and between riverine and floodplain habitat	Limit water use during spring run-off and maintain minimum flows year around.	Work with private landowners and irrigation companies to identify opportunities for water efficacies. Work with partners to establish a minimum flow on Bear River and its tributaries and Bear Lake tributaries.	Northern Leopard Frog Western Toad Trumpeter Swan Sandhill Crane Long-billed Curlew White-faced Ibis Hoary Bat Silver-haired Bat Townsend's big-eared Bat Western Small-footed Myotis Little Brown Myotis California Floater Pond Snail (Stagnicola) Species Group Rotund Physa Rocky Mountain Duskysnail Bear Lake Springsnail Utah Sallfly

Infrastructure

Infrastructure such as roads, highways, high-voltage transmission lines, pipelines, towers, and fences can present a threat to many wildlife species. Existing infrastructure causes fragmentation, as well as loss of habitat that affects many wildlife species. Roads not only fragment habitat, they also are a source of direct mortality for wildlife species. Power lines will present a collision risk to bird species and provide hunting perches for raptors and ravens may have predation implications for other species. Collision risk is a particular threat for Trumpeter Swan and Sandhill Crane using riverine habitat in the Bear Lake Ecological Section.

A specific proposed project that presents threats to wildlife and wildlife habitat in the Bear Lake Section is the Gateway West Transmission Line Project (http://www.gatewaywestproject.com/). The projects approved route will run the transmission lines through riverine habitat, including Bear River crossings.

Objective	Strategy	Action(s)	Target SGCNs
Reduce impacts of roads and energy transmission projects on wildlife and wildlife habitat	Coordinate development/location and management of roads, powerlines, pipelines, etc. to avoid important habitat areas and minimize the impact to wildlife.	Place roads and energy related infrastructure away from riparian areas and other sensitive wildlife habitat. Place new roads, power lines, and infrastructure projects along existing corridors or within other altered habitats to the extent possible. Place seasonal closures on roads to protect wildlife during critical time periods, such as wintering, breeding, fawning/calving.	Trumpeter Swan Sandhill Crane White-faced Ibis
Reduce bird power line strikes and electrocutions	Work with power companies to implement practices and install apparatus to reduce collisions and electrocutions.	Keep records of bird power line collisions and electrocutions. Monitor new power lines to document collision and electrocution concerns. Identity and map areas with power line collisions and electrocutions. Bury power lines in areas that experience bird strikes. Attach bird diverters to make power lines more visible. Modify power line structures to eliminate bird perch/roosting sites.	Trumpeter Swan Sandhill Crane White-faced Ibis

Species designation, planning and monitoring

In addition to the conservation actions to address specific threats, some species require inventory and monitoring to assess their status and distribution in Idaho. Population monitoring and surveys to determine distribution are needed for several species in the Bear Lake Ecological Section.

Objective	Strategy	Action(s)	Target SGCNs
Improve our knowledge of wildlife populations and distribution using the riverine habitat target.	Conduct surveys to monitor species populations.	In collaboration with land management agency partners and private landowners, conduct long-term monitoring surveys at established intervals to document population (as well as distribution) changes. Use volunteers, master naturalists, and citizen scientists to the extent possible.	Northern Leopard Frog
	Conduct surveys to document species presence, distribution, and abundance.	In collaboration with land management agency partners and private landowners, conduct surveys to document species presence, distribution and abundance. Use volunteers, master naturalists, and	Long-billed Curlew Western Toad Bear Lake Springsnail Rocky Mountain Duskysnail California Floater Pond Snail (Stagnicola)

Objective	Strategy	Action(s)	Target SGCNs
		citizen scientists to the extent possible.	Species group Rotund Physa Utah Sallfly

Target: Depressional Wetlands

Depressional wetlands account for approximately 7 percent of the vegetation land cover type in the Bear Lake Ecological Section. The importance of this habitat type in the Bear Lake Section is emphasized by the fact that wetlands are scarce in the Intermountain West due to the arid climate of the region (Ratti and Kadlec 1992), and account for about one percent of the surface area in the Intermountain West (Dahl 1990). The Bear Lake Section wetlands are influenced by snowmelt and rain, and range from infrequent to semi-permanent or permanently flooded. In the Bear Lake Section the target includes primarily shallow water and deep water marshes associated with the Bear Lake NWR. The target also includes wetlands associated with old oxbows and meanders of the Bear River. On the Bear Lake NWR this target provides important nesting habitat for several SGCN bird species, including Trumpeter Swan and American Bittern and colony nesting species such as White-faced Ibis, Caspian Tern, Franklin's Gull and Clark's and Western Grebe. This target also provide habitat for northern leopard frog and western toad.

The extensive bulrush and cattail marsh associated with the Bear Lake NWR provides habitat for several SGCN, including Trumpeter Swan. Since 2002 over 50 Trumpeter Swans have been released on to the NWR in an effort to establish nesting pairs. The goal of establishing 3-5 nesting pairs on the refuge was achieved and the last release occurred in 2006.

Target Viability

Depressional wetland habitat is generally only in fair condition in the Bear Lake Ecological Section, due impacts of water management and altered hydrological regimes. The diversion of water from Bear River into the Bear Lake for irrigation storage purposes has altered the hydrology and natural process of large tract of wetland habitat located at the north end of Bear Lake, much of which is encompassed in the Bear Lake National Wildlife Refuge. The abundance of wetlands in western states has been reduced 30–91% between the 1780s and mid-1980s, with an estimated loss of 57% of historic wetlands in the Intermountain West (Dahl 1990, Ratti and Kadlec 1992). Although the rate of wetland loss nationally has slowed over time, the loss of freshwater emergent marsh habitat has continued (Dahl 2006, Copeland et al. 2010). The Bear lake

watershed wetlands, now mostly comprised of Bear Lake NWR, have declined from a pre-1900 core-marsh base of 30-35,000 acres to present day core-marsh base of 17,000 acres (USFWS 2013).

Spotlight Species of Greatest Conservation Need: American Bittern

American Bitterns are found seasonally in Idaho, breeding in several locations, including managed wetlands associated with State Wildlife Management Areas and National Wildlife Refuges. Nesting habitat chiefly includes freshwater wetlands with tall, emergent vegetation, primarily bulrush and cattail, and rarely dense upland vegetation surround wetland habitat. Most nests have been found placed over water that is 5-20 cm deep, in dense emergent vegetation, using surrounding vegetation to construct a platform. Breeding Bird Survey data indicate long-term (1966-2013) population declines in the US and the western BBS region of -1.5% and -3.4% per year, respectively. BBS data also indicate both long-term (1966-2013) and short-term (2003-2013) declines in Idaho of greater than -15% per year, however, these trends are based upon extremely small sample sizes and should be interpreted cautiously. Surveys conducted throughout Idaho in 2005-2007 indicated that Bear Lake National Wildlife Refuge supported the densest population of American Bitterns in the state (IDFG unpublished data). There is concern at Bear Lake NWR that the once dense population of bitterns, as documented by these surveys, has declined dramatically in recent years. Loss of suitable wetland habitat is of primary concern for American Bitterns, and managing these wetlands for the structural characteristics needed by American Bitterns can be a challenge. For example, some sites may need burning to open decadent stands of bulrush and cattail, which can be logistically and financially difficult to accomplish. Impacts of climate change, particularly from drought, are also of concern for this species. Declines in US may indicate a northern population shift, in part because of habitat destruction and drought at southern extent of this species' range.

Prioritized Threats and Strategies for Depressional Wetlands

High rated threats to Depressional Wetlands in the Bear Lake Ecological Section

Mining

This threat specifically refers to the Paris Hills Mine, an underground phosphate mine located near Paris, Idaho. The mine and supporting infrastructure will affect upland sagebrush steppe habitat, however the higher concern at this point in the project is that ground water will accumulate in the mine and will need to be pumped from the mine back into the ground. This process may affect wetlands in the valley floor. Anticipated contaminate levels in the waste water are unknown, as are potential negative impacts to wetland habitat and associated wildlife species.

Objective	Strategy	Action(s)	Target SGCNs
Reduce	Work with mining	Gain a better understanding of the	Northern Leopard Frog

Objective	Strategy	Action(s)	Target SGCNs
potential affect from mining waste water to wetland habitat and associated fish and wildlife species.	company to reduce affects to fish and wildlife and key habitats.	level and types of contaminates in the waste water and the potential effects on wetland habitat and wildlife from contaminates. Explore alternative techniques to dispose of waste water in order to reduce negative effects.	Western Toad Trumpeter Swan Sandhill Crane Black Tern Caspian Tern Clark's Grebe Western Grebe White-faced Ibis American Bittern California Gull Franklin's Gull

Invasive aquatic plants and invertebrates

There is an increasing threat to wetland habitat from invasive aquatic plants and invertebrates. This threat includes plants such as purple loosestrife (*Lythrum salicaria*) and phragmites (*Phragmites australis*) and invertebrates such as quagga mussel (*Dreissena bugensis*) and zebra mussel (*Dreissena polymorpha*). These invasive species are transported into areas by boats, vehicles, and on boots and clothing. Once in an area they are easily dispersed in the aquatic system and difficult to control.

Objective	Strategy	Action(s)	Target SGCNs
Reduce the risk of invasive species infestations	Continue/expand monitoring/control of invasive species	Explore opportunities for additional funds for increased resources and personnel if needed. Use volunteers and citizens scientists to detect and control invasive species.	Northern Leopard Frog Western Toad Trumpeter Swan Sandhill Crane Black Tern Caspian Tern Clark's Grebe Western Grebe White-faced Ibis American Bittern California Gull Franklin's Gull
	Use boat wash stations	Continue the current Idaho Department of Agriculture program administered at key points. Ensure that boaters using Bear Lake are checked and have access to a boat wash station.	Northern Leopard Frog Western Toad Trumpeter Swan Sandhill Crane Black Tern Caspian Tern Clark's Grebe Western Grebe White-faced Ibis American Bittern California Gull Franklin's Gull
	Educate the public on detection and control of invasive species.	Collaboration between resource management agencies and conservation NGOs to develop education materials for public land users and private landowners. These materials should include identification information as well as control measures. Develop an outreach program to	Northern Leopard Frog Western Toad Trumpeter Swan Sandhill Crane Black Tern Caspian Tern Clark's Grebe Western Grebe White-faced Ibis

Objective	Strategy	Action(s)	Target SGCNs
		distribute materials and provide technical support.	American Bittern California Gull Franklin's Gull

Dam management/water storage

Dams that control the flow of water through the Bear Lake NWR marsh for irrigation storage impact the wetlands. The Bear Lake National Wildlife Refuge and Oxford Slough Waterfowl Production Area Comprehensive Conservation Plan states water level management is the overriding factor affecting habitat management strategies for wildlife, particularly nesting birds on the Bear Lake NWR (USFWS 2013). The document further summarizes the following alterations and impacts. Alterations: 1) The Bear River now flows into Bear Lake; 2) Bear Lake and Bear Lake NWR marsh have been separated and now serve as irrigation function; 3) Water control structures are used to regulate water levels. Impacts: 1) The marsh now functions as a turbid, brought-flow system as opposed to the historic freshwater discharge system; 2) Sediment deposition occurs at a greater frequency; 3) Excessive turbidity decreases plant germination and growth; 4) natural spring high water runoff has been replaced with water levels that are regulated annually, rather than seasonally, for storage of spring runoff and release of stored water in summer; 5) Absence of drought has led to less frequency of disturbance (e.g. fire) which has resulted in more homogenous emergent plant communities.

Objective	Strategy	Action(s)	Target SGCNs
Maintain/protect or restore natural wetlands to mimic historic function and value.	Work with private landowners and land managers to identify opportunities to restore, enhance, preserve, and protect wetlands.	Work with partners to secure adequate water supplies for managed wetlands and terminal basins to conserve their ecological integrity and functional values. Work with partners, such as Ducks Unlimited, to identify areas historically classified as natural wetlands and have hydrological potential for restoration.	Northern Leopard Frog Western Toad Trumpeter Swan Sandhill Crane Black Tern Caspian Tern Clark's Grebe Western Grebe White-faced ibis American Bittern California Gull Franklin's Gull
Reduce water usage to ensure appropriate water levels in Bear Lake, Bear River, and associated wetlands.	Enroll/maintain acreage in CRP/SAFE and other land conservation programs.	Encourage landowners to work with NRCS to use wildlife conservation practices on private range and agricultural lands.	Northern Leopard Frog Western Toad Trumpeter Swan Sandhill Crane Black Tern Caspian Tern Clark's Grebe Western Grebe White-faced ibis American Bittern California Gull Franklin's Gull
	Ensure (?) water use does not exceed water right allocation.	Work with irrigation companies to insure water use is appropriately allotted. Promote the use of improved equipment for accurate cfs	Northern Leopard Frog Western Toad Trumpeter Swan Sandhill Crane Black Tern Caspian Tern

Objective	Strategy	Action(s)	Target SGCNs
		measurement.	Clark's Grebe Western Grebe White-faced ibis American Bittern California Gull Franklin's Gull
	Improve irrigation practices and equipment for more efficient use.	Where appropriate encourage the conversion from flood irrigation to sprinkler irrigation.	Northern Leopard Frog Western Toad Trumpeter Swan Sandhill Crane Black Tern Caspian Tern Clark's Grebe Western Grebe White-faced ibis American Bittern California Gull Franklin's Gull
Increase island nesting habitat availability	Work with land and water managers to identify opportunities to improve/enhance island nesting habitat	Work with water managers to develop and implement water level management guidelines during the breeding season that balance irrigation and wildlife needs. Work with land managers, such as FWS, to create new nesting locations that will not be subject to water level concerns in the foreseeable future.	Caspian Tern California Gull

Water management altering hydrograph

The diversion of water for crop and pasture irrigation affects the riverine hydrograph as well as water quality, water quantity, and has resulted in the loss and degradation of riparian habitat. The altered hydrography of the Bear River flood plain, caused by lower than normal flows in the spring and summer, reduces the viability of depressional wetlands. The altered hydrograph has resulted in the loss or decline of connectivity within riverine systems and between riverine and floodplain habitat. The diversion of water from streams in the spring results lower than normal flows, rather than allowing for more natural high water runoff flows that connects and recharges the floodplain.

Objective	Strategy	Action(s)	Target SGCNs
Reduce water use to maintain a more natural hydrograph	Enroll/maintain acreage in CRP/SAFE and other land conservation programs.	Encourage landowners to work with NRCS to use wildlife conservation practices on private range and agricultural lands.	Northern Leopard Frog Western Toad Trumpeter Swan Sandhill Crane Black Tern Caspian Tern Clark's Grebe Western Grebe White-faced ibis American Bittern California Gull

Objective	Strategy	Action(s)	Target SGCNs
			Franklin's Gull
	Water use does not exceed water right allocation.	Work with irrigation companies to insure water use is appropriately allotted. Promote the use of improved equipment for accurate cfs measurement.	Northern Leopard Frog Western Toad Trumpeter Swan Sandhill Crane Black Tern Caspian Tern Clark's Grebe Western Grebe White-faced ibis American Bittern California Gull Franklin's Gull
	Improve irrigation practices and equipment for more efficient use.	Where appropriate encourage the conversion from flood irrigation to sprinkler irrigation.	Northern Leopard Frog Western Toad Trumpeter Swan Sandhill Crane Black Tern Caspian Tern Clark's Grebe Western Grebe White-faced ibis American Bittern California Gull Franklin's Gull

Infrastructure

Infrastructure such as roads, highways, high-voltage transmission lines, pipelines, towers, and fences can present a threat to many wildlife species. Existing infrastructure causes fragmentation, as well as loss of habitat that affects many wildlife species. Roads not only fragment habitat, they also are a source of direct mortality for wildlife species. Power lines will present a collision risk to bird species and provide hunting perches for raptors and ravens may have predation implications for other species. Collision risk is a particular threat for Trumpeter Swan and Sandhill Crane using wetland habitat in the Bear Lake Section.

Objective	Strategy	Action(s)	Target SGCNs
Reduce bird power line strikes and electrocutions	Work with power companies to implement practices and install apparatus to reduce collisions and electrocutions.	Keep records of bird power line collisions and electrocutions. Monitor new power lines to document collision and electrocution concerns. Identity and map areas with power line collisions and electrocutions. Bury power lines in areas that experience bird strikes. Attach bird diverters to make power lines more visible. Modify power line structures to	Northern Leopard Frog Western Toad Trumpeter Swan Sandhill Crane White-faced Ibis

Objective	Strategy	Action(s)	Target SGCNs
		eliminate bird perch/roosting sites.	

Species designation, planning and monitoring

In addition to the conservation actions to address specific threats, some species require inventory and monitoring to assess their status and distribution in Idaho. Population monitoring and surveys to determine distribution are needed for several species in the Bear Lake Ecological Section.

Objective	Strategy	Action(s)	Target SGCNs
Improve our knowledge of wetland dependent wildlife populations and distribution	Conduct surveys to monitor species populations.	In collaboration with land management agency partners and private landowners, conduct long-term monitoring surveys at established intervals to document population (as well as distribution) changes. Use volunteers, master naturalists, and citizen scientists to the extent possible.	Northern Leopard Frog Trumpeter Swan American Bittern Caspian Tern Franklin's Gull California Gull White-faced Ibis
	Conduct surveys to document species presence, distribution, and abundance.	In collaboration with land management agency partners and private landowners, conduct surveys to document species presence, distribution, and abundance. Use volunteers, master naturalists, and citizen scientists to the extent possible.	Black Tern Clark's Grebe Western Grebe Western Toad

Target: Bear Lake Endemic Fish

Bear Lake contains a unique fish fauna that includes four endemic species. These species include Bear Lake sculpin, Bear Lake whitefish, Bonneville cisco, and Bonneville whitefish. The whitefish and cisco provide unique recreational opportunity on the Lake. Bonneville cutthroat trout are present in both Bear Lake and Bear River and are an important conservation and recreation species for the Bear Lake Ecological Section. Also present in Bear Lake are nonnative Lake trout, rainbow trout, brook trout, brown trout, and yellow perch (*Perca flavescens*). These species provide important recreational value. Native Utah sucker (*Catostomus ardens*) and Utah chub (*Gila atraria*) are also present in the Lake. Common Carp (*Cyprinus carpio*) are present in the Bear Lake and associated wetland complex (Mud Lake) north of the lake included in Bear Lake NWR. Carp present a conservation threat to the maintenance of quality aquatic habitat in Bear Lake, the wetland complex north of the Lake, and Bear River.

Target Viability

Because Bear Lake spans both Idaho and Utah, fisheries resources in the Lake are managed collaboratively by the two states through the implementation of the Bear Lake Fisheries Management Plan (Tolentino and Teuscher, 2010). The Bear Lake Management Plan includes population objectives for endemic fish species. Endemic fish populations are monitored to insure these population targets are being met. Lake trout are a predatory species that may present a risk to the populations of endemic fish and other native fish species present in Bear Lake. As such, the Bear Lake Management Plan calls for adjusting lake trout stocking if endemic fish populations targets are not met. Nonnative recreational fish present and stocked in Bear Lake are managed to insure the persistence of viable populations of native fish species. There is an assumption that if the populations of endemic fish are healthy the entire lake ecosystem will be conserved.

The Bear Lake Sculpin is an endemic species to Bear Lake. It uses the benthic (bottom) habitat of the Lake feeding on invertebrates. It spawns near the shore in mid-April to mid-May. Eggs are attached to the undersides of rocks and males guard the egg masses. It is a forage species for predatory fish such as native Bonneville cutthroat trout and non-native lake trout.

Prioritized Threats and Strategies for Bear Lake Endemic Fish

High rated threats to Bear Lake Endemic Fish in the Bear Lake Ecological Section

Dam management/water storage

Water is now diverted from the Bear River into Bear Lake to store for annual irrigation needs. The current use of Bear Lake as an irrigation water storage facility results in fluctuating water levels that do not mimic the natural seasonal changes in the Lake's water elevations. Shoreline cobble provides spawning habitat for endemic fish species. Impacts to productions may occur if Bear Lake water level recedes below areas with spawning cobble due to the draw down for irrigation purposes.

Objective	Strategy	Action(s)	Target SGCNs
Reduce water usage to help maintain water levels above spawning areas in Bear Lake	Enroll/maintain acreage in CRP/SAFE and other land conservation programs.	Encourage landowners to work with NRCS to use wildlife conservation practices on private range and agricultural lands.	Bear Lake Sculpin Bear Lake Whitefish Bonneville Cisco Bonneville Whitefish

Objective	Strategy	Action(s)	Target SGCNs
	Water use does not exceed water right allocation.	Work with irrigation companies to insure water use is appropriately allotted. Promote the use of improved equipment for accurate cfs measurement.	Bear Lake Sculpin Bear Lake Whitefish Bonneville Cisco Bonneville Whitefish
	Improve irrigation practices and equipment for more efficient use.	Convert from flood irrigation to sprinkler irrigation.	Bear Lake Sculpin Bear Lake Whitefish Bonneville Cisco Bonneville Whitefish
Improve spawning habitat	Maintain appropriate water levels to provide adequate spawning habitat.	Work with water users and water management entities to maintain appropriate water levels.	Bear Lake Sculpin Bear Lake Whitefish Bonneville Cisco Bonneville Whitefish

Invasive aquatic plants and invertebrates

There is an increasing threat to wetland habitat from invasive aquatic plants and invertebrates. This threat includes plants such as purple loosestrife (*Lythrum salicaria*) and phragmites (*Phragmites australis*) and invertebrates such as quagga mussel (*Dreissena bugensis*) and zebra mussel (*Dreissena polymorpha*). These invasive species are transported into areas by boats, vehicles, and on boots and clothing. Once in an area they are easily dispersed in the aquatic system and difficult to control.

Objective	Strategy	Action(s)	Target SGCNs
Reduce the risk of invasive species infestations	Continue/expand monitoring/control of invasive species	Explore opportunities for additional funds for increased resources and personnel if needed. Explore the use volunteers and citizens scientists to detect and control invasive species.	Bear Lake Sculpin Bear Lake Whitefish Bonneville Cisco Bonneville Whitefish
	Use boat wash stations	Continue the current Idaho Department of Agriculture program administered at key points. Insure that boaters using Bear Lake are checked and have access to a boat wash station.	Bear Lake Sculpin Bear Lake Whitefish Bonneville Cisco Bonneville Whitefish
	Educate the public on detection and control of invasive species.	Collaboration between resource management agencies and conservation NGOs to develop education materials for public land users and private landowners. These materials should include identification information as well as control measures. Develop an outreach program to distribute materials and provide technical support.	Bear Lake Sculpin Bear Lake Whitefish Bonneville Cisco Bonneville Whitefish

Important Medium rated threat to endemic fishes in the Bear Lake Section

Predation and competition with introduced fish

Current stock rates and population levels of nonnative fish are not a high conservation concern to endemic fish populations. However, monitoring fish populations and species composition in Bear Lake will continue to be important to detect changes in population status. If changes are detected the Bear Lake Fisheries Management Plan (Tolentino and Teuscher 2010) provides guidance.

Objective	Strategy	Action(s)	Target SGCNs
Reduce the risk of nonnative fish to impact endemic fish populations.	State agencies will maintain nonnative fish populations at levels that allow for sustaining viable populations of native fish.	Agencies will adjust stock rates of nonnative fish if endemic populations fall below target objectives.	Bear Lake Sculpin Bear Lake Whitefish Bonneville Cisco Bonneville Whitefish
	Enforce regulations regarding the unauthorized stocking of fish.	Use public outreach to educate on the potential negative impacts to endemic fish. Use enforcement actions as necessary.	Bear Lake Sculpin Bear Lake Whitefish Bonneville Cisco Bonneville Whitefish
	Monitor for presence of undesirable species.	Continue current program to monitor Bear Lake for species composition.	Bear Lake Sculpin Bear Lake Whitefish Bonneville Cisco Bonneville Whitefish

Species designation, planning and monitoring

Objective	Strategy	Action(s)	Target SGCNs
Improve our knowledge of endemic fish populations in Bear Lake	Maintain long-term monitoring of endemic fish populations.	In collaboration with Utah Division of Wildlife Resources conduct long-term monitoring surveys at established intervals to document population changes.	Bear Lake Sculpin Bear Lake Whitefish Bonneville Cisco Bonneville Whitefish

Target: Movement Corridor

An important wildlife movement corridor exists that links big game summer habitats north of the Bear Lake Plateau with winter range on the Plateau. The fall/winter movement through the corridor is generally southward from the Caribou National Forest through the Sheep Creek Hills across US Highway 30, the Union Pacific Railroad tracks, and the Bear River. In the spring, deer move northward from the Bear Lake Plateau to their summer range. The most concentrated movement in through an area referred to as Rocky Point. Mule deer mortality as they move through this corridor, due to vehicle collisions, is linked to golden and bald eagle mortality

resulting from vehicle collisions as well. This movement corridor may also provide a dispersal corridor for wolverine (IDFG 2014).

Target Viability

US Highway 30 and Union Pacific Railroad bisect the wildlife movement corridor. The highway is used extensively by commercial semi-trucks as a 'short-cut' between Interstates 15 and 80. An estimated 3,000 mule deer move through this corridor to winter on the Bear Lake Plateau. Mule deer/vehicle collisions are common between Montpelier and the Wyoming Border, particularly during the fall and spring migration as well as during winter months. Mule deer mortalities provide scavenging opportunities for Bald and Golden Eagles leading to eagle/vehicle collisions and subsequent eagle mortalities.

Prioritized Threats and Strategies for the Movement Corridor

Important Medium rated threat to the Movement Corridor in the Bear Lake Section

Vehicle collisions

The Bear Lake Ecological Section appears to be a relatively important wintering area for Golden Eagles and Bald Eagles, based on general observations as well as Mid-Winter Bald Eagle Survey data. The average number of Golden Eagles observed during midwinter surveys 1980-2010 was six and ranged from 0–16 http://srfs.wr.usgs.gov/wintergoea/ . The average number of Bald Eagles observed during midwinter surveys 1986-2012 was 7 and ranged from 1–16 http://gis.nacse.org/eagles/routes.php. IDFG has begun placing greater emphasis on documenting and reporting wildlife road kill in recent years and the data shows the between 2010 and 2014, 10 Golden Eagle and 7 Bald Eagle mortalities were reported from vehicle collisions on Hwy 30 between Montpelier and the Wyoming Border, with the highest concentration in or near the area referred to as Rocky Point https://idfg.idaho.gov/species/roadkill/list.

Objective	Strategy	Action(s)	Target SGCNs
Protect important movement habitat	Protect connectivity habitat from development to insure corridor remains intact and to insure right of way for possible fencing and over/under passes.	Obtain Conservation easements for private property with NGO or Agency. Retain BLM and IDL parcels in public ownership.	Wolverine Golden Eagle
Reduce vehicle/wildlife collisions	Implement animal detection and warning signs	Work with ITD to test animal detection equipment that is linked to warning signs. Work with ITD to install appropriate 'wildlife on roadway' warning signs, such as permanent signs and portable digital reader board signs.	Wolverine Golden Eagle
	Remove wildlife, particularly, deer	Collaborate with ITD personnel and to keep road way clear of carcasses, particularly in the	Wolverine Golden Eagle

Objective	Strategy	Action(s)	Target SGCNs
	carcasses from the road sides.	winter.	
	Install wildlife exclusion fencing and associated under/over passes.	Work with ITD to develop long-range plan for wildlife exclusion fencing with under or over passes for wildlife in the Rocky Point area of US Highway 30. Work with ITD, USFWS, and other entities to identify potential funding sources for wildlife exclusion fencing and under or over passage for wildlife.	Wolverine Golden Eagle

Species designation, planning and monitoring

Road kills, including Golden Eagle mortalities due to vehicle collisions, should be recorded in the IDFG road kill database. IDFG and ITD should collaborate to document all road kills, including golden eagles.

Objective	Strategy	Action(s)	Target SGCNs
Identify high risk areas for eagle/vehicle collisions.	Maintain records of eagle mortalities from vehicle collisions.	Coordination between IDFG and ITD to report eagle mortalities on IDFG road kill reporting system on website.	Golden Eagle

Target: Pollinators

Pollinators provide important ecosystem functions to natural systems in the Bear Lake Ecological Section. Additionally, pollinators provide an essential ecosystem service which benefits agricultural producers, agricultural consumers, and gardeners (Mader et al 2011). Two butterflies (Kriemhild Fritillary and monarchs) and three bees (Western Bumblebee, Suckley Cuckoo Bumblebee, Hunt Bumblebee, and Morrison Bumble Bee) comprise the group of five SGCN pollinators which are known to occur within this ecological section. However, little is known about species distribution, and population status.

Target Viability

The viability of this target is not well understood in the Bear Lake Ecological Section. However, many pollinators, but particularly bees, are known to be experiencing population declines throughout North America (Mader et al 2011) and those declines may be occurring within the Bear Lake Section as well. Population declines and local die offs occur for a variety of reasons including habitat loss, pesticide exposure, and climate change (Mader et al 2011). Farmers, habitat mangers, roadway authorities, municipalities, and homeowners can all contribute to pollinator conservation.

Prioritized Threats and Strategies for Pollinators

High Rated Threats to the Pollinators in the Bear Lake Ecological Section

Habitat loss and degradation

Pollinators require foraging and nesting habitat. Providing both types of habitat within close proximity to each other is the best way to ensure pollinator success. Educating land managers about techniques to reduce land management impacts to pollinators is an essential component to pollinator habitat management. Protecting, enhancing, and creating pollinator habitat can provide a positive way to engage with local communities.

Objective	Strategy	Action(s)	Target SGCNs
Reduce impact of land management practices on pollinators.	Educate about and implement practices which benefit pollinators.	Promote the reduction of grazing impacts by limiting grazing to one third to one fourth of management areas per season (Mader et al 2011). Promote the implementation pollinator beneficial mowing techniques including use of flushing bar, cutting at ≤8 mph, maintaining a high minimum cutting height of ≥12–16 inches, mowing only in daylight hours, and mow in a mosaic instead of an entire site (Mader et al 2011). Where prescribed fire is used, promote the implementation of pollinator friendly burning protocols including rotational burning of ≤30% of each site every few years, leave small unburned patched intact, avoid burning too frequently (no more than every 5–10 years), avoid high intensity fires unless the burn goal is tree removal. Work with Idaho Department of Transportation to implement proper roadside pollinator habitat management.	Hunt Bumble Bee Morrison Bumble Bee Western bumble Bee Suckley Cuckoo Bumble Bee Kriemhild Fritillary Monarch
	Conserve existing pollinator habitat.	Conduct surveys for native milkweed. Initiate seed saving program. Map existing major known pollinator habitat. Identify and recognize landowners providing pollinator habitat and provide habitat management educational opportunity.	Hunt Bumble Bee Morrison Bumble Bee Western bumble Bee Suckley Cuckoo Bumble Bee Kriemhild Fritillary Monarch
Create new urban and rural pollinator habitat.	Develop programs to encourage urban landowners to create pollinator	Provide pollinator habitat workshops and educational materials for homeowners and rural land owners. Explore the ways to provide an	

Objective	Strategy	Action(s)	Target SGCNs
	habitat.	incentive program for homeowners to create pollinator habitat. Work with municipalities and businesses to create urban pollinator habitat. Promote the use of and provide bee nest boxes	

Pesticides

Pollinators are negatively affected by pesticides by absorbing pesticides through the exoskeleton, drinking nectar containing pesticides, and carrying pollen laced with pesticides back to colonies (Mader et al 2011). Neonicotinoids are particularly harmful to bee populations and can cause dramatic die-offs (Hopwood et al 2012). While the most effective strategy for benefitting pollinators is to eliminate pesticide use, significant benefit for pollinators can still be achieve through reducing use of and pollinator exposure to pesticides (Mader et al 2011).

Objective	Strategy	Action(s)	Target SGCNs
Reduce native pollinator exposure to pesticides	Educate habitat managers, farmers, municipalities, and small property owners in methods to reduce or eliminate pesticide use.	Collaborate with partners to develop and distribute educational materials, including the use of workshops and seminars that encourage and the elimination and reduction of pesticide use where practical. As well as provide techniques to do so, such as, apply the minimum amount of chemical necessary and apply when pollinators are least active (i.e. nighttime and when flowers are not blooming) (Mader et al 2011). Specifically target urban homeowners in educational efforts in the elimination of or proper application of pesticides Conduct workshops which discuss pesticides in relation to other pollinator habitat management concerns.	Hunt Bumble Bee Morrison Bumble Bee Western bumble Bee Suckley Cuckoo Bumble Bee Kriemhild Fritillary Monarch
	Eliminate use of neonicotinoid insecticides (Hopwood et al 2012).	Develop and distribute educational material on the detrimental effects of neonicotinoids on bees (Hopwood et al 2012). Distribute to municipalities, counties, agriculture producers, habitat managers, and other property owners. Do not employ the use of neonicotinoids on IDFG administered lands (Hopwood et al 2012).	Hunt Bumble Bee Morrison Bumble Bee Western bumble Bee Suckley Cuckoo Bumble Bee Kriemhild Fritillary Monarch
	Reduce native pollinator exposure to pesticides on IDFG administered property.	Use the minimum recommended amount of pesticide. Apply pesticides at times when pollinators are least active such as nighttime, cool periods, low wind activity, and when flowers are not blooming.	Hunt Bumble Bee Morrison Bumble Bee Western bumble Bee Suckley Cuckoo Bumble Bee Kriemhild Fritillary Monarch

Objective	Strategy	Action(s)	Target SGCNs
		Mow or otherwise remove flowering weeds before applying pesticides.	

Species designation, planning and monitoring

In addition to the conservation actions to address specific threats, some species require inventory and monitoring to assess their status and distribution in Idaho. Having a better understanding of species distribution and population status will enhance the effectiveness of other conservation strategies and actions. Population monitoring and surveys to determine distribution are needed for the SGCN pollinator species in the Bear Lake Ecological Section.

Objective	Strategy	Action(s)	Target SGCNs
Improve our knowledge of pollinator populations and distribution	Conduct surveys to document species presence, distribution, and population status.	Conduct surveys to determine species breeding sites and colonies. Establish long-term monitoring programs. Use volunteers, master naturalists, and citizen scientists to assist with surveys and monitoring.	Hunt Bumble Bee Morrison Bumble Bee Western bumble Bee Suckley Cuckoo Bumble Bee Kriemhild Fritillary Monarch

Bear Lake Section Team

An initial version of the Bear Lake Section project plan was completed for the 2005 Idaho State Wildlife Action Plan (formerly Comprehensive Wildlife Conservation Strategy). A small working group developed an initial draft of the Section Plan (Miradi v. 0.4), which was then reviewed by a wider group of partners and stakeholders during a 2-day workshop held at the Idaho Department of Fish and Game Pocatello office, Idaho in August 2014 (this input was captured in Miradi v. 0.5). That draft was then subsequently distributed for additional stakeholder input including a 1-day meeting in November 2014 and March 2015. Since then, we have continued to work with key internal and external stakeholders to improve upon the plan. Individuals, agencies, and organizations involved in this plan are listed in Table 14.3.

Table 14.3 Individuals, agencies, and organizations involved in developing this plan[a]

First name	Last name	Affiliation
Martha	Wackenhut*[b]	Idaho Department of Fish and Game
Quinn	Shurtliff*	Gonzales–Stoller Surveillance, LLC(GSS)
Becky	Abel	Idaho Department of Fish and Game
Ryan	Hillyard	Idaho Department of Fish and Game
Ty	Matthews	US Fish and Wildlife Service
Cary	Myler	US Fish and Wildlife Service
Devon	Green	US Forest Service
James	Kumm	Bureau of Land Management (retired)
Charles	Peterson	Idaho State University
Jerry	DeBacker	Sagebrush Steppe Land Trust (retired)

[a] Apologies for any inadvertent omissions.
[b] An asterisk "*" denotes team leader(s) and contact point if you would like to become involved in this work.

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